Reviewer Comments

Comment 1: Coordinate-invariant face-level geometry

In Section 2.2, around line 130, the manuscript states that modern implementations formulate the relevant inner products in three-dimensional Euclidean space to obtain coordinate-invariant expressions, citing Ullrich et al. (2009). This discussion could be strengthened by also citing recent work on closed-form face-level geometry for spherical polygons. For example, Chen et al. (2026) provide formulas for the mass centroid, first moment, and area of arbitrary spherical polygonal faces, including boundary-integral expressions for great-circle polygons and correction terms for constant-latitude edges. This reference would help clarify the distinction between the coordinate-invariant mass centroid of a spherical face and the pivot longitude introduced later, which is a metric-weighted reference coordinate for the longitudinal second-order moment.

Comment 2: Connection between RLL grids and unstructured source grids

The discussion around line 270 is difficult to follow because it moves from the RLL-grid case to unstructured source grids without explaining the connection. The preceding discussion focuses on regular latitude-longitude cells, where the mid-longitude offset can coincide with the pivot longitude and reduce or eliminate the inconsistency. Unstructured source grids are a different geometric setting, often represented by general spherical polygons with great-circle-arc edges. If the intended point is that CDO users cannot encounter this issue for unstructured source grids because REMAPCON2 is unavailable, this should be stated directly. Otherwise, the paragraph may suggest that the RLL-specific cancellation also applies to unstructured grids, which would require justification.

Comment 3: Intersection-computation inaccuracies

Around line 290, the manuscript mentions possible inaccuracies in J99/SCRIP intersection computation, but the type of inaccuracy is unclear. Please clarify whether this refers to the geometric treatment of edge types, such as great-circle versus constant-latitude edges, or to floating-point robustness in edge-edge intersections. This distinction matters because the experiments are intended to isolate sensitivity to inconsistent reference longitudes. If overlap-construction errors are also present, it may be difficult to attribute the observed errors to the longitude-offset issue alone. Chen et al. (2026) may be useful here, as they discuss robust spherical edge-edge intersections for different edge types and common sources of numerical error.

Minor comment: Presentation and scope

The manuscript could be more compact. The contribution is a focused correction to the J99/SCRIP second-order conservative remapping formulation, but the central point only becomes fully clear in Sections 2.2 and 2.3. Stating the main goal earlier and shortening some background or derivational material would make the structure clearer and better highlight the proposed correction.

Reference

Chen, H., Ullrich, P. A., Panetta, J., Marsico, D., Hanke, M., Jain, R., Zhang, C., and Jacob, R. L.: Accurate and Robust Geometric Algorithms for Regridding on the Sphere, EGUsphere, 2026, 1-40, https://doi.org/10.5194/egusphere-2026-636, 2026.